
A New Combination in *Piptochaetium* (Poaceae, Stipeae) from Chile

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ABSTRACT. The new combination, *Piptochaetium depressum* (Steudel) C. Peña, is proposed for the Poaceae (Stipeae) based on lemma shape and ornamentation that clearly distinguishes Chilean plants. A key is provided to distinguish six species in Chile, with a morphological description and SEM images for the new combination.

Key words: Chile, *Piptochaetium*, Poaceae, Stipeae.

Piptochaetium J. Presl is an American genus of 36 species placed in the grass tribe Stipeae (Cialdella, 2003). The geographical distribution of the genus is from southern Chile and Argentina, north to the United States (Cialdella & Arriaga, 1998; Cialdella & Giussani, 2002). *Piptochaetium* is found in temperate, cold-temperate, and warm regions of both hemispheres, but is absent or poorly represented in the tropics (Nicora & Rùgolo de Agrasar, 1987). *Piptochaetium* is more diverse in South America with 27 species. The most recent treatments that include Chilean species are Parodi (1944) and Cialdella and Arriaga (1998), both recognizing seven species.

Piptochaetium is a perennial, caespitose grass, with membranaceous ligules. The inflorescence is a panicle generally contracted (lax in *P. bicolor* (Vahl) E. Desvaux), few or multi-spiculate, with short branches. The spikelets are 1-flowered, compressed laterally, and disarticulating above the glumes. Glumes are usually longer than the lemma, membranaceous, awned, and 3- to 7-nerved. The lemma is coriaceous, striate, not convolute, longitudinally grooved, glabrous, with papillae, prickles, or hooks, the margins inrolled and tucked into the palea groove, with a crown, generally with papillae, prickles, or microhairs, and is exceeded by the palea. The awn is 1- or 2-geniculate, persistent or caducous, delicate, with a twisted column, hispidulous at the base and rough at the apex. The callus is acute and sharp, or obtuse and obliquely truncate, and more or less pubescent.

Piptochaetium resembles *Jarava* Ruiz & Pavón and *Nassella* (Trinius) E. Desvaux, but is readily distinguished by the combination of a few morphological characters. In *Piptochaetium*, the margins of the lemma clasp the sulcus of the palea, and the summit is sometimes expanded into a paleal crown. In *Jarava*

and *Nassella*, the lemma is convolute and encloses the palea. In *Piptochaetium*, the palea is coriaceous, grooved, 2-keeled, and with the apical mucro projecting from the lemma apex. In contrast, the palea in *Jarava* and *Nassella* is hyaline, not grooved, shorter than the lemma, and with two or no nerves.

According to the infrageneric classification, *Piptochaetium* is divided into two sections (Parodi, 1944), both with species in Chile. The sections principally differ in the callus shape and awn persistence. The section *Piptochaetium* is characterized by an obtuse callus and caducous awn, and comprises five species. *Piptochaetium* sect. *Podopogon* (Rafinesque) Parodi is characterized by an acute callus and persistent awn, with one species, *P. bicolor* in Chile.

Toward a better understanding of the morphological variation in the genus *Piptochaetium*, 362 specimens from the CONC and SGO herbaria were analyzed, including type material. Additionally, material of *P. montevidense* (Sprengler) Parodi from Argentina (SI: Cialdella 16, Renvoize 4336, Tovar 9322, Mùlgura 1498, Burkart 13431, Dusén 2381, Barros 3940) and Brazil (COL: *Grazrotin* 3624) was analyzed. One specimen from each province was chosen. SEM imaging was used to evaluate the micromorphological characters; one anthoecium from herbarium material for each species was removed. Ellis' terminology was used for the epidermal appendages of the lemma (Ellis, 1979). A complete description of the new combination is given here; for the remaining species descriptions see Cialdella and Arriaga (1998). An identification key was then constructed.

In the present work, six taxa of *Piptochaetium* are recognized in Chile: *P. angolense* Philippi, *P. bicolor*, *P. depressum* (Steudel) C. Peña, *P. panicoides* (Lamarck) E. Desvaux, *P. setosum* (Trinius) Arechavaleta, and *P. stipoides* (Trinius & Ruprecht) Hackel ex Arechavaleta var. *stipoides*. The species are distributed in Chile from Región de Coquimbo (29°54'S) to Región de Los Ríos (40°36'S), concentrated on the coast and in the central valley, at altitudes up to 1800 m.

Piptochaetium depressum (Steudel) C. Peña, comb. nov. Basionym: *Urachne depressa* Steudel, Syn. Pl. Glumac. 1: 123. 1854. TYPE: Chile. Rancagua,

May 1828, *C. G. Bertero 456* (holotype, P; isotype, MPU not seen).

Piptochaetium verrucosum Philippi, *Linnaea* 33(3–4): 280. 1864. TYPE: Chile. [Los Ríos:] Valdivia, San Juan, s.d., *R. A. Philippi s.n.* (holotype, SGO 57334; isotypes, SGO 57350 not seen, US 1108653 fragm. ex SGO, US 823178 fragm. ex SGO, US fragm. ex SGO PHIL 36).

Piptochaetium humile Philippi, *Anales Univ. Chile* 93: 730. 1896. TYPE: Chile. [Valparaiso:] Concón, médanos, 12 Oct. 1884, *F. Philippi s.n.* (holotype, SGO 45087; isotypes, US, photo SGO 45087, US fragm. ex SGO PHIL 46).

Piptochaetium granulatum Philippi, *Anales Univ. Chile* 93: 732. 1896. TYPE: Chile. [Valparaiso:] Concón, Oct. 1884, *F. Philippi s.n.* (holotype, SGO 57333; isotypes, US 1819509 fragm. ex SGO, US fragm. ex SGO PHIL 51, US photo SGO 57333).

Piptochaetium moelleri Philippi, *Anales Univ. Chile* 93: 734. 1896. TYPE: Chile. [Araucanía:] Renaico, Nov. 1887, *P. Möller s.n.* (holotype, SGO 57332).

Culms 16–60 cm high, 0.4–0.5 mm diam., with 2 or 3 nodes, compressed, glabrous; internodes 4.5–14 cm. Sheaths 3.9–5.8 cm, margin membranous or hyaline; ligules truncate or obtuse, 1–1.8 mm, glabrous; blades narrow and convolute, 4.8–10.5 cm × 0.4–0.6 mm. Panicles 4–4.7 × 3.9–7 cm, with 25 to 35 spikelets, branches contracted. Spikelets 3–4 × 1.1–1.5 mm; glumes glabrous, central zone violaceous to the base, lower glume 2.5–4.1 mm, 5-nerved; upper glume 2.1–4 mm, 3-nerved; lemmas obovoid, 1.9–2.5 × 1–1.6 mm, contracted below the crown, longitudinally grooved, glabrous, with recurved hooks at the very top and distributed densely and uniformly over the lemma surface, sparser below and almost absent toward the callus; crown 0.4–0.5 mm diam., margins with hooks and prickles; callus obtuse, 0.2–0.3 mm, pubescent, hairs no longer than 1/4 of lemma; awn geniculate or bigeniculate, caducous, 0.8–1.5 cm; palea 1.6–2.2 mm; lodicules 2, 0.5–0.6 mm; stamens 0.5–0.7 mm; ovary 0.4–0.7 mm. Caryopsis 1–1.5 mm.

Distribution. *Piptochaetium depressum* is distributed in Chile from the Región de Coquimbo to Región de Los Ríos (31°35'–40°36'S), growing from near sea level to about 1500 m, preferentially concentrated in the coastal zone and central valley, but poorly represented in the Andes.

Relationships. *Piptochaetium depressum* is characterized by the obovoid lemmas, with hooks distributed over the entire surface, becoming less dense toward the crown, almost absent above the callus (Fig. 1A, B). *Piptochaetium depressum* is similar to *P. montevidense* and can share some features with *P. angolense*. In fact, the specimens of *P. depressum* have been previously identified as *P. montevidense*, but can be easily distinguished from this species because *P. montevidense* presents the lemma always gibbous, with papillae almost

absent under the crown and diminishing above the callus (Fig. 1C, D). With this nomenclatural change, *P. montevidense* is absent in Chile. *Piptochaetium depressum* differs from *P. angolense* by the distribution and type of hooks on the lemma. In *P. angolense* these are found in the upper 3/4 of the lemma surface (Fig. 1E, F), and in *P. depressum* hooks are distributed over the entire surface from the apex to callus. In addition, these two species share a sympatric geographic distribution.

Representative specimens examined. CHILE. **Región del Biobío:** Prov. Ñuble, Cobquecura, Fundo La Reforma, Nov. 1958, *Matthei s.n.* (CONC); Prov. Concepción, Talcahuano, Rocoto, *Villarroel y Weldt 104 A* (CONC); Prov. Biobío, Laja, Hacienda Las Canteras entre Antuco y Los Angeles, *C. Muñoz y G. T. Johnson 2738* (SGO). **Región de Coquimbo:** Prov. Choapa, Huentelauquén, *Jiles 2808* (CONC). **Región de La Araucanía:** Prov. Malleco, Mininco, *Montero 8808* (CONC). **Región del Libertador General Bernardo O'Higgins:** Prov. Cardenal Caro, 19 km E de Pichilemu, 2.6 km O de Puente Los Valles, *Lammers et al. 7887* (SGO); Prov. Cachapoal, Palmería de Cocalán, *C. Muñoz, Bartlett y Zudzuki 3516* (SGO). **Región de Los Ríos:** Prov. Valdivia, San José de la Mariquina, *Klempau 416 y 452* (CONC). **Región del Maule:** Prov. Talca, Pumanquén, *D. Contreras y F. Oyanedel 494* (SGO); Prov. Linares, Reserva Nac. Los Bellotos del Melado, *Arroyo et al. 994895* (CONC); Prov. Cauquenes, Cauquenes, Nov. 1960, *Ruiz s.n.* (CONC). **Región Metropolitana:** Prov. Santiago, Cuesta La Dormida, Nov. 1950, *Behn K. s.n.* (CONC); Prov. Cordillera, Reserva Nac. Río Clarillo, *Araya 46* (CONC); Prov. Maipo, Cajón del Maipo frente desembocadura El Manzano, *M. Muñoz et al. 3409* (SGO). **Región de Valparaíso:** Prov. Petorca, Huaquen, *Koehler 218* (CONC); Prov. Quillota, Los Maitenes, cerro de La Comunidad, *Garaventa 5204* (CONC); Prov. Valparaíso, Ritoque, 2 km SO de Quintero, *Serey 3* (CONC); Prov. San Antonio, Llolleo, Fundo Las Brizas, *San Martín M. 344* (SGO).

KEY TO PIPTOCHAETIUM IN CHILE

- 1a. Callus acute with macrohairs longer than 1/2 length of lemma; awns persistent, bigeniculate; crown with macrohairs 0.4–0.5 mm.
 *P. bicolor* sect. *Podopogon*
- 1b. Callus obtuse with macrohairs no longer than 1/2 length of lemma; awns caducous, geniculate or bigeniculate; crown with hooks or prickles to 0.3 mm, but without macrohairs.
 *Piptochaetium* sect. *Piptochaetium*

KEY TO SPECIES OF PIPTOCHAETIUM SECT. PIPTOCHAETIUM IN CHILE

- 1a. Lemma obconical; callus densely pubescent with macrohairs to 1/2 length of lemma; crown revolute with more than 5 rows of prickles on margin.
 *P. stipoides*
- 1b. Lemma elliptic to conspicuously gibbous; callus pubescent with hairs no longer than 1/3 length of lemma; crown not revolute, with 1 to 3 rows of prickles or hooks 2
- 2a. Lemma conspicuously gibbous, with maximum width in the middle, glabrous, with papillae below the crown, rarely with hooks on the

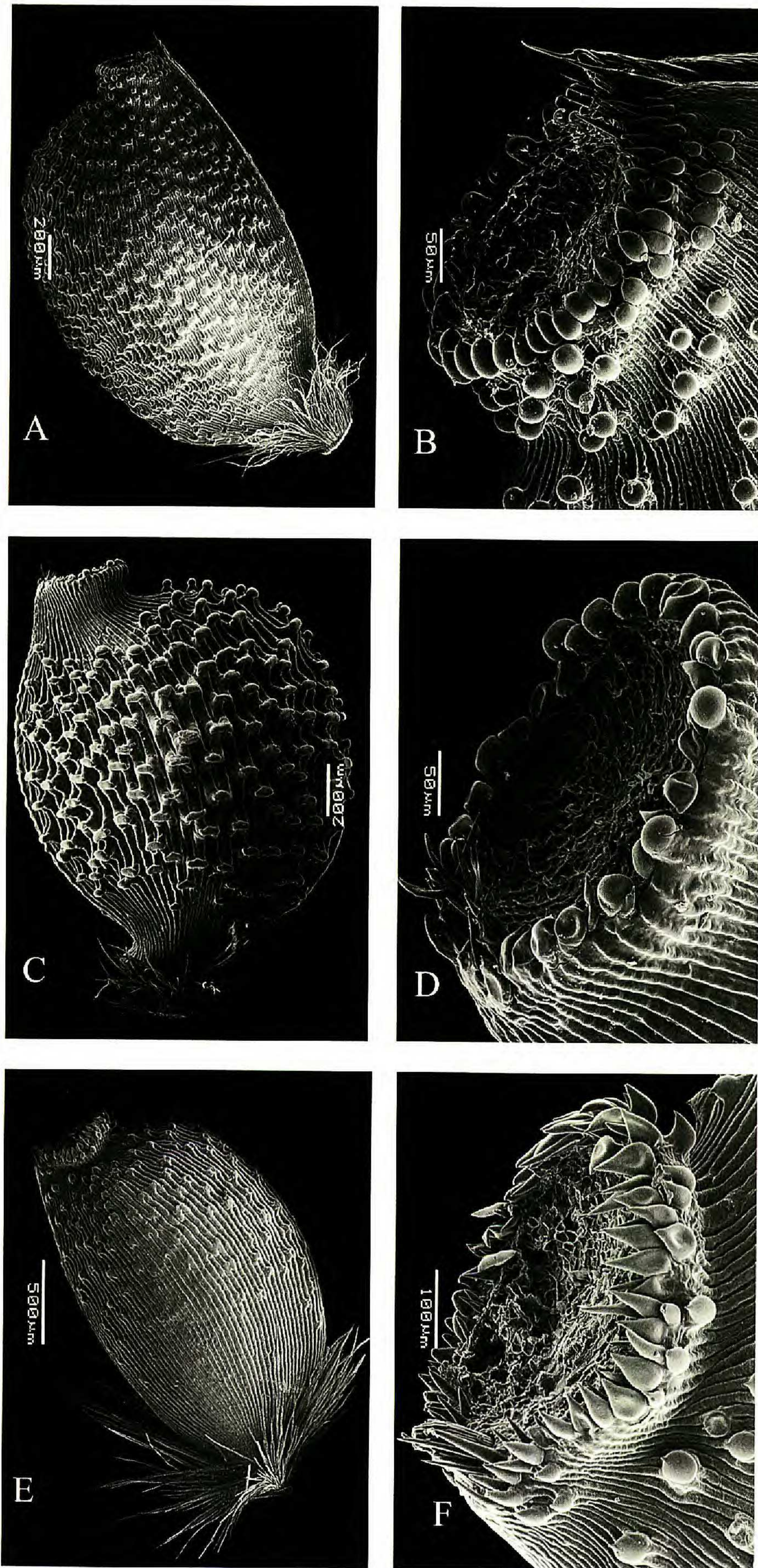


Figure 1. A, B. *Piptochaetium depressum* (Steudel) C. Peña (Montero 8808, CONC). —A. Anthoecium. —B. Crown. C, D. *Piptochaetium montevidense* (Sprengler) Parodi (Cialdella 16, SI). —C. Anthoecium. —D. Crown. E, F. *Piptochaetium angolense* Philippi (Marticorena & Rodríguez 1722, CONC). —E. Anthoecium. —F. Crown.

- dorsal side; crowns with tiny hooks
. *P. panicoides*
- 2b. Lemma elliptic to gibbous, with maximum width
just below the crown, generally with hooks;
crowns with conspicuous prickles or hooks3
- 3a. Hooks densely and uniformly distributed
on lemma surface, fewer toward the crown
and absent toward the callus . . . *P. depressum*
- 3b. Hooks on the distal 3/4 of the lemma or
fewer below the crown 4
- 4a. Hooks densely and uniformly dis-
tributed on the distal 3/4 length of
the lemma; crown with 2 to 3 rows of
prickles; callus hairs less than 1/3
length of lemma *P. angolense*
- 4b. Hooks only a few below the crown;
lemma glabrous; crown with one row
of prickles; callus hairs more than
1/3 length of lemma. *P. setosum*

Acknowledgments. We are grateful to the University of Concepción for financial support (grant no. DIUC 204.111.038-1.0). We also thank Ana Cialdella, Clodomiro Marticorena, and the reviewers for

providing valuable suggestions to improve the manuscript.

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